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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) SHORE PROTECTION PROGRAM		5. TYPE OF REPORT & PERIOD COVERED
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Department of the Army Office Chief of Engineers Washington, D.C. 20314		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Department of the Army Coastal Engineering Research Center Kingman Building, Fort Belvoir, Virginia 22060		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 11 Jun 71
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE July 1970 (Revised June 1971)
		13. NUMBER OF PAGES 30
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Local cooperation Public laws Project development Shore protection		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Report provides information on assistance by the Corps of Engineers in shore protection. Corps of Engineers programs, project development, local cooperation, and public laws related to shoreline protection are presented.		

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Information on Assistance by the
Corps of Engineers in Shore Protection

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July 1970
Revised June 1971

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PREFACE

Wide, sandy beaches are one of America's most popular and prized attractions. They provide outdoor recreation for millions of all ages and interests and from all walks of life. But they do more than this; they also provide the best natural defense against storm and hurricane-induced flooding.

The sands of the beaches are constantly moving. The same winds, waves, tides, and currents that carry sand away from one area of shore replace it with sand from another area unless and until other influences interfere. Near shoreline structures essential to the well being of society may interrupt the flow of sand along the shore, and structures on tributary rivers may reduce or eliminate supplies of sand. When the natural equilibrium is upset -- whatever the cause -- erosion of some beaches results.

The restoration and protection of America's shoreline are everyone's concern. Congressional recognition of national concern has produced legislation which permits the Corps of Engineers to join local forces in the fight against beach erosion. Today, as much as 70 percent of the cost of protecting publicly owned shores may come from Federal funds if certain conservation, development, and use requirements are satisfied. Projects not meeting these requirements may still be as much as 50 percent federally funded. Shore protection may be structural -- groins, seawalls, bulkheads, jetties, sand replenishment, -- or natural -- sand conservation, vegetation. Careful study must precede selection of method.

The Corps of Engineers has been developing methods of shore protection since 1930. Continuing investigations by the Corps' Coastal Engineering Research Center expand knowledge and understanding of the physical phenomena, principles, techniques, and procedures related to the protection and restoration of our beaches and shores. Continuing construction of shore protection and restoration facilities reinforces the technical and construction "know-how" that produces sound economical solutions.

Division and District Engineers of the Corps of Engineers stand ready with their professional staffs to advise and assist agencies of local and State governments at all times. Engineer experts with long experience in shore protection and beach restoration will provide technical advice upon request and will provide guidance and advice on procedures and programs when Federal construction effort is needed.

INTRODUCTION

Beach and shore erosion is one of the Nation's pressing problems. The United States' shorelines, including those of the Great Lakes, total about 94,000 miles. The number of Americans using these shorelines is steadily increasing. At present, 75 percent of the population of the United States lives in States bordering on the oceans and Great Lakes; and 12 of our 13 largest cities are located in the coastal zone. The unrelenting pressures generated by this growing population and its demand for shoreline land for homes, industries, transportation terminals, recreation and marine foods quicken interest and concern in the protection and restoration of beaches and shores. At the Federal level, this interest and concern have led to increasing involvement in shore protection. The increasing Federal interest has been paralleled by expanding interest on the part of the coastal States.

Before 1930, Federal interest in shore problems was limited to the protection of Federal property and improvements for navigation. At that time, an advisory "Board on Sand Movement and Beach Erosion" appointed by the Chief of Engineers was the principal instrumentality of the Federal Government in this field. In 1930, the Congress assumed a broader role in shore protection by authorizing creation of the Beach Erosion Board. Four of the seven members of the Board were Corps of Engineers officers and the other three were from State agencies. It was empowered to make studies of beach erosion problems at the request of, and in cooperation with, cities, counties, or States. The Federal

Government bore up to half of the cost of each study but did not bear any of the construction costs unless federally owned property was involved.

In 1946, the Corps was given additional authority, and Federal contributions to construction costs were permitted when projects protected publicly owned shores. In 1956, further amendment of the basic beach erosion legislation authorized Federal involvement in the protection of private property if such protection was incidental to the protection of publicly owned shores, or if such protection would result in public benefits. The Federal role was again expanded in 1962 when legislation was enacted to increase the proportion of construction cost borne by the Federal Government and to make the total cost of studies a Federal responsibility. Recent legislation (in 1968) directs the Chief of Engineers to make an appraisal, investigation and study of the erosion problems of the coasts of the United States and the shorelines of the Great Lakes, including estuaries and bays thereof. This study is not expected to generate recommendations for construction to protect specific problem areas, but it will appraise coastal erosion problems from the national viewpoint, will array the problem areas in meaningful priority order, will inventory the shoreline, an increasingly valuable resource, and will provide sound information for planning and action at all governmental levels.

Hurricane protection is closely related to shore erosion control and protection. After the great hurricanes of 1954 and 1955 caused the

loss of 200 lives and flood and wave damage totaling more than \$1 billion, Congress directed the Corps of Engineers and other concerned Federal agencies to develop protective measures. This legislation led to improved hurricane forecasting and warning services, and to authorizations for the construction by the Corps of Engineers of projects for hurricane protection. The Federal Government pays 70 percent of the construction cost of such projects. In many locations, broad comprehensive planning develops multiple-purpose projects providing shore protection, beach restoration, and hurricane protection which benefit public recreation and navigation, and protect and preserve fish and wildlife.

CORPS OF ENGINEERS PROGRAMS

As the Federal interest in shore protection and beach restoration has increased, so has the involvement of the Corps of Engineers. By various legislative actions, the Congress has directed the Chief of Engineers to carry out the policies and programs established to protect and restore the Nation's shorelines.

Under these legislative authorities, the Corps of Engineers researches the causes of beach erosion, investigates and studies specific beach erosion problems, and constructs -- or, in certain cases, reimburses local and State governments for constructing -- shore protection and beach restoration projects.

In the early 1930's the Corps of Engineers began investigations of the various forces at work along coasts and shores. Today, the Corps'

Coastal Engineering Research Center is deeply involved in investigations of shore processes, storm frequencies, and storm-tide elevations. Research into remedial measures is accomplished at the Center by its engineers and scientists; in addition, many significant programs are carried out by universities and private research organizations under contracts with the Center. Much of the field work essential to these research efforts is accomplished by staff members of the various Corps of Engineers Districts. The results of this research are published and widely disseminated in the United States, and are also supplied on an exchange basis to foreign institutions and agencies. As a result of this exchange, the Coastal Engineering Research Center is well informed of world-wide research progress. Appendix 3 lists some of the publications of the Coastal Engineering Research Center.

The research program is the base on which the planning and construction programs depend. Without research, the effectiveness of completed projects might be uncertain and costly overdesign or failure might be common. But the shore protection programs are the payoff in terms of preservation of natural beaches and recreational areas as well as the protection of life and property. Here the battle with the relentless sea is actually fought.

Shore protection and beach restoration projects may be categorized in a number of ways. For the purposes of this discussion it is convenient to group projects in two programs - one consisting of projects specifically and individually authorized by Congress and the second

consisting of projects for which individual authorization by Congress is not required. Hereafter in this discussion these programs will be referred to as the regular project program and the small project program. The latter program is limited to projects for which the Federal share of the construction cost will not exceed \$1 million. In addition, if the erosion is attributable to Federal navigation works, mitigating measures costing not more than \$1 million can be constructed entirely at Federal cost without specific Congressional authorization.

PROJECT DEVELOPMENT

Shore protection and beach restoration projects begin with a local request for help. Any person or group of persons desiring assistance in combating beach erosion can obtain information and advice from any Corps of Engineers District or Division office. Eroded publicly owned shores and shores eroded because of Federal navigation works are eligible for Federal assistance; privately owned shores may be eligible for Federal assistance if there is public benefit such as that arising from public use. Parties desiring information, advice, and assistance in combating beach erosion can usually be most effective by acting through and in cooperation with the State, county, or city agency concerned with beach and shore use and management. The agency, in turn, can reinforce its effectiveness by early consultation with the appropriate District or Division Engineer to explore any question of eligibility and applicability of the small project program, or the program for mitigating erosion caused by Federal navigation works. If either of these programs is applicable, the Secretary of the Army can authorize a beach erosion study at the request of the responsible local agency. If the study shows

the project to be justified and the local interests involved are willing and able to cooperate as required by law, the Secretary of the Army can authorize construction of the project and allot funds for that purpose from available civil works appropriations.

Beach erosion studies for the regular project program must be individually authorized by the Congress. Usually, the study authorization is granted by a resolution approved by the Public Works Committee of either the Senate or the House of Representatives; less frequently, it is included in a River and Harbor Act adopted by the Congress and approved by the President. If consultation with the District or Division Engineer indicates that the small project program is inapplicable, the local interests involved, acting through the community's elected representatives in the Congress, should request the Congress to authorize and fund a beach erosion investigation and study. The District or Division Engineer will begin the study as soon as the necessary authorization and funds are provided.

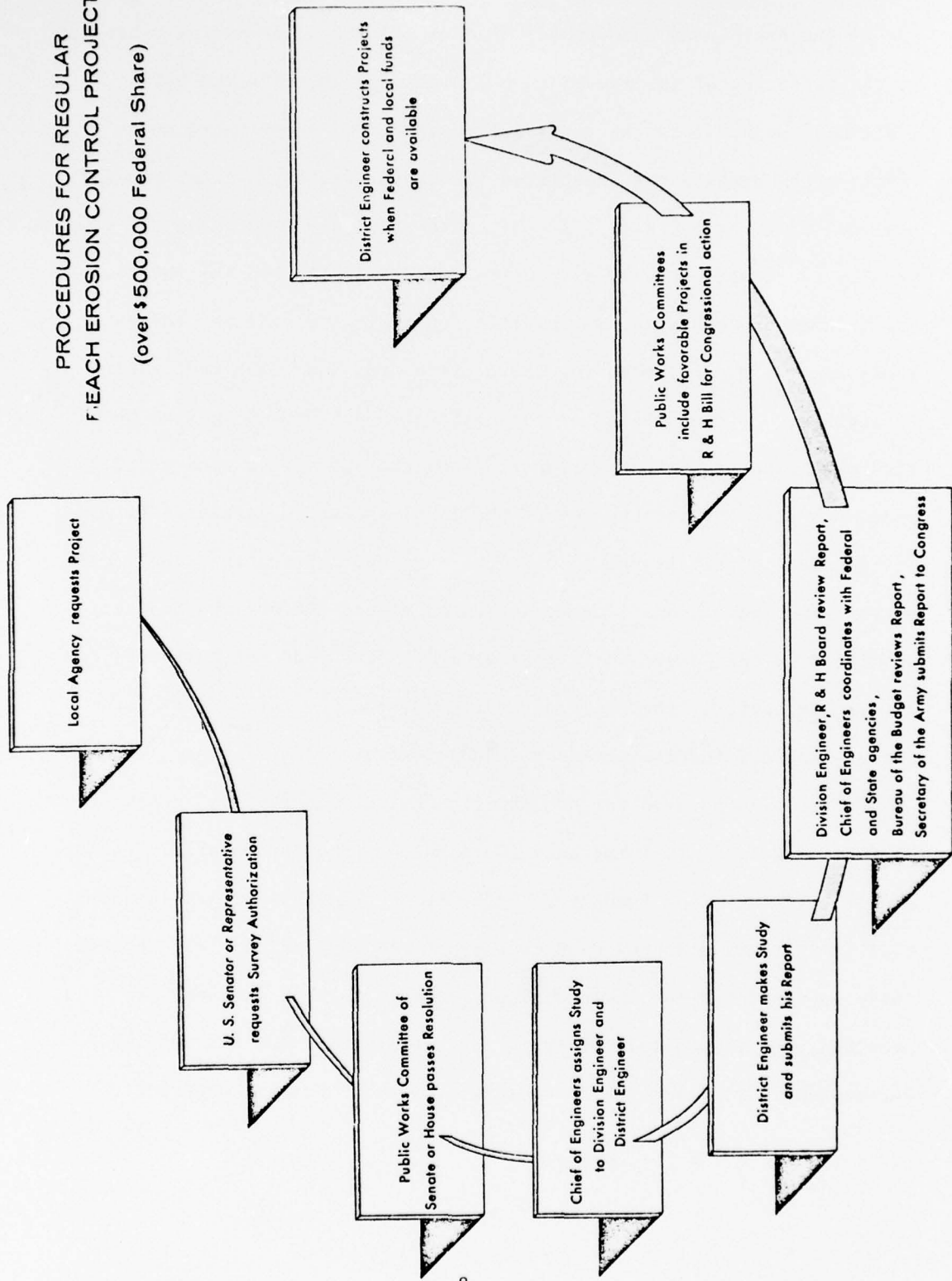
Normally, the local interests sponsoring the study and the District or Division Engineer responsible for its prosecution will continue consultations, exchange information, and make plans for conducting the study while the authorization and fund allocation actions are in progress.

The investigation and study are intended to determine whether a Federal project is justified and, if so, whether its construction is feasible. One of the early concerns of the Engineer Officer directing the study is the ascertainment of the desires and opinions of all parties

affected by, or having an interest in, the protection, improvement, and use of the shore area concerned. To this end, he holds a public hearing at the beginning of the study; if the situation warrants, he holds additional hearings as the study progresses. The study thoroughly examines the problem and identifies the causal factors. After careful analyses of the impacts of all applicable remedial measures on the erosion problem, on other shore areas, on the regimen of the coastal waters, on areal shore processes, on marine life, on ecological values, and on shore uses, a general plan for shore protection and beach restoration is devised. If comparisons of the costs of construction and the benefits resulting from the construction show the project to be a sound and prudent public investment, and if the local sponsoring agency affirms willingness and ability to provide the required cooperation, the report on the study recommends adoption of the project. Before the report is submitted to the Congress, it is reviewed by the Board of Engineers for Rivers and Harbors, the Chief of Engineers, the Governors of affected States, and all interested Federal departments.

Projects authorized for construction by the Congress are considered by the Congress as it formulates the annual appropriation bill. (As previously mentioned, funds for constructing the small project construction program are allotted by Secretary of the Army and are not specifically appropriated for individual projects.) As soon as funds are provided, the responsible District Engineer carries out the detailed engineering work essential to construction and prepares construction

PROCEDURES FOR REGULAR
F EACH EROSION CONTROL PROJECTS
(over \$500,000 Federal Share)



drawings and specifications. Contractors submit bids based on these drawings and specifications and a construction contract is awarded to the successful bidder. The District Engineer continues to consult and coordinate with the local sponsoring agency while engineering and construction are underway. Upon completion, the protective works are turned over to the sponsoring local interests for operation and maintenance in accordance with the authorizing legislation. Section 215 of Public Law 90-483 permits local interests to expedite construction of authorized projects for which Federal funds are not immediately available. Under certain circumstances if local interests proceed with construction at their expense, the Federal share of the cost of that construction can be reimbursed from later appropriations. Such reimbursement cannot exceed \$1 million.

LOCAL COOPERATION

The State or political subdivision faced with shore protection and beach restoration problems usually selects one of its agencies to represent local interests and cooperate with the Corps of Engineers. This agency becomes an integral part of the Federal-local team and works with the responsible District or Division Engineer during the investigation, planning, engineering, and construction phases of project development. Often, this same agency operates and maintains the completed project.

The legislation establishing the Federal shore protection and beach

restoration programs declares it to be "the policy of the United States to assist in the construction, but not the maintenance, of works for the improvement and protection against erosion by waves and currents of the shores of the United States, its territories and possessions."

In its present form, the legislation spells out the conditions for, and the extent of, Federal participation. Basically, it relates Federal participation to public benefit and requires the active participation of the sponsoring local interests. Under this concept, Federal participation is greatest where the protected shore areas are publicly owned and appropriate facilities to encourage full public use are provided. As much as 70 percent of the construction cost can be borne by the Federal Government in such cases. At the opposite end of the scale, where the protected shore area is privately owned and there is no public use, no Federal funds can be provided. Between these extremes, Federal participation in providing protection is proportional to public use and benefit. The remaining costs are borne by the sponsoring local interests. Additionally, local interest are normally required to provide all necessary lands, easements, and rights-of-way, hold and save the United States free from claims for damages, prevent water pollution which would affect the health of bathers, maintain the completed works, and assure continued public use of the protected area. Other legislation provides that the Federal Government bear the entire cost of protecting federally owned shore areas and of mitigating or preventing shore damages attributable to Federal navigation works.

APPENDIX 1

PUBLIC LAW 520, 71ST CONGRESS
Approved July 3, 1930

Be it enacted by the Senate and the House of Representatives of the United States in Congress assembled, that -----

SEC. 2 The Chief of Engineers of the United States Army, under the direction of the Secretary of War, is authorized and directed to cause investigations and studies to be made in cooperation with the appropriate agencies of various States on the Atlantic, Pacific, and Gulf coasts and on the Great Lakes, and the Territories, with a view to devising effective means of preventing erosion of the shores of coastal and lake waters by waves and currents; and any expenses incident and necessary thereto may be paid from funds appropriated for examinations, Surveys and Contingencies for Rivers and Harbors: Provided, That the War Department may release to the appropriate State agencies information obtained by these investigations and studies prior to the formal transmission of reports to Congress: Provided further, That no money shall be expended under authority of this section in any State which does not provide for cooperation with the agents of the United States and contribute to the project such funds and/or services as the Secretary of War may deem appropriate and require; that there shall be organized under the Chief of Engineers, United States Army, by detail from time to time from the Corps of Engineers and from the engineers of State agencies charged with beach erosion and shore protection, a board of seven members, of whom four shall be officers of the Corps of Engineers and three shall be selected with regard to their special fitness by the Chief of Engineers from among the State agencies cooperating with the War Department. The board will furnish such technical assistance as may be directed by the Chief of Engineers in the conduct of such studies as may be undertaken and will review the reports of the investigations made. In the consideration of such studies as may be referred to the board by the Chief of Engineers, the board shall, when it considers it necessary and with the sanction of the Chief of Engineers, make, as a board or through its members, personal examinations of localities under investigation: Provided further, That the salary of the civilian members shall be paid by their respective States, but the traveling and other necessary expenses connected with their duties on the board shall be paid in accordance with the law and regulations governing the payment of such expenses to civilian employees of the Engineer Department.

PUBLIC LAW 409, 74TH CONGRESS
Approved August 30, 1935

SEC. 5. Every report submitted to Congress in pursuance of any provisions of law for preliminary examination and survey looking to the improvement of the entrance at the mouth of any river or at any inlet, in addition to other information which the Congress has directed shall be given, shall contain information concerning the configuration of the shore line and the probable effect thereon that may be expected to result from the improvement having particular reference to erosion and/or accretion for a distance of not less than ten miles on either side of the said entrance.

PUBLIC LAW 166, 79TH CONGRESS
Approved July 31, 1945

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in addition to participating in cooperative investigations and studies with agencies of the various States as authorized in Section 2 of the River and Harbor Act, approved July 3, 1930, it shall be the duty of the Chief of Engineers, through the Beach Erosion Board to make general investigations with a view to preventing erosion of the shores of the United States by waves and currents and determining the most suitable methods for the protection, restoration, and development of beaches; and to publish from time to time such useful data and information concerning the erosion and protection of beaches and shore lines as the Board may deem to be of value to the people of the United States. The cost of the general investigations herein authorized shall be borne wholly by the United States. As used in this Act, the word "shores" includes the shore lines of the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, Lake Champlain, and estuaries and bays directly connected therewith.

SEC. 2. All provisions of existing law relating to examinations and surveys and to works of improvement of rivers and harbors shall apply, insofar as practicable, to examinations and surveys and to works of improvement relating to shore protection; except that all projects having to do with shore protection shall be referred for consideration and recommendation to the Beach Erosion Board instead of to the Board of Engineers for Rivers and Harbors.

SEC. 3. The Beach Erosion Board, in making its report on any cooperative investigation and studies under the provisions of Section 2 of the River and Harbor Act, approved July 3, 1930, relating to shore protection work shall, in addition to any other matters upon which it may be required to report, state its opinion as to (a) the advisability of adopting the project; (b) what public interest, if any, is involved in the proposed improvement; and (c) what share of the expense, if any, should be borne by the United States.

SEC. 4. Any expenses incident and necessary in the undertaking of the general investigations authorized herein may be paid from funds hitherto or hereafter appropriated for examinations, surveys, and contingencies for rivers and harbors.

PUBLIC LAW 727, 79TH CONGRESS, Approved August 13, 1946
as amended by
PUBLIC LAW 826, 84TH CONGRESS, Approved July 28, 1956
PUBLIC LAW 874, 87TH CONGRESS, Approved October 23, 1962
PUBLIC LAW 298, 89TH CONGRESS, Approved October 27, 1965, and
PUBLIC LAW 611, 91ST CONGRESS, Approved December 31, 1970

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) with the purpose of preventing damage to the shores of the United States, its Territories and possessions and promoting and encouraging the healthful recreation of the people, it is hereby declared to be the policy of the United States, subject to the following provisions of this Act to assist in the construction but not the maintenance, of works for the restoration and protection against erosion, by waves and currents, of the shores of the United States, its Territories and possessions.

(b) The Federal contribution in the case of any project referred to in subsection (a) shall not exceed one-half of the cost of the project, and the remainder shall be paid by the State, municipality, or other political subdivision in which the project is located except that (1) the costs allocated to the restoration and protection of Federal property shall be borne fully by the Federal Government, (2) Federal participation in the cost of a project for restoration and protection of State, county, and other publicly owned shore parks and conservation areas may be, in the discretion of the Chief of Engineers, not more than 70 percent of the total cost exclusive of land costs, when such areas: Include a zone which excludes permanent human habitation; include but are not limited to recreational beaches, satisfy adequate criteria for conservation and development of the natural resources of the environment; extend landward a sufficient distance to include, where appropriate, protective dunes, bluffs, or other natural features which serve to protect the uplands from damage; and provide essentially full park facilities for appropriate public use, all of which shall meet with the approval of the Chief of Engineers, and (3) Federal participation in the cost of a project providing hurricane protection may be, in the discretion of the Secretary of the Army, acting through the Chief of Engineers, not more than 70 per centum of the total cost exclusive of land costs.

(c) When in the opinion of the Chief of Engineers the most suitable and economical remedial measures would be provided by periodic beach nourishment, the term 'construction' may be construed for the purposes of this Act to include the deposit of sand fill at suitable intervals of time to furnish sand supply to project shores for a length of time specified by the Chief of Engineers.

(d) Shores other than public will be eligible for Federal assistance if there is benefit such as that arising from public use or from the protection of nearby public property or if the benefits to those shores are incidental to the project, and the Federal contribution to the project shall be adjusted in accordance with the degree of such benefits.

(e) No Federal contribution shall be made with respect to a project under this Act unless the plan therefor shall have been specifically

adopted and authorized by Congress after investigation and study by the Beach Erosion Board under the provisions of Section 2 of the River and Harbor Act approved July 3, 1930, as amended and supplemented, or, in the case of a small project under Section 3 of this Act, unless the plan therefor has been approved by the Chief of Engineers.

SEC. 2. The Secretary of the Army is hereby authorized to reimburse local interests for work done by them, after initiation of the survey studies which form the basis for the project, on authorized projects which individually do not exceed \$1,000,000 in total cost: Provided, That the work which may have been done on the projects is approved by the Chief of Engineers as being in accordance with the authorized projects: Provided further, That such reimbursement shall be subject to appropriations applicable thereto or funds available therefor and shall not take precedence over other pending projects of higher priority for improvements.

SEC. 3. The Secretary of the Army is hereby authorized to undertake construction of small shore and beach restoration and protection projects not specifically authorized by Congress, which otherwise comply with section 1 of this Act, when he finds that such work is advisable, and he is further authorized to allot from any appropriations hereafter made for civil works, not to exceed \$25,000,000 for any one fiscal year for the Federal share of the costs of construction of such projects: Provided, That not more than \$1,000,000 shall be allotted for this purpose for any single project and the total amount allotted shall be sufficient to complete the Federal participation in the project under this section including periodic nourishment as provided for under section 1(c) of this Act: Provided further, That the provisions of local cooperation specified in section 1 of this Act shall apply: And provided further, That the work shall be complete in itself and shall not commit the United States to any additional improvement to insure its successful operation, except for participation in periodic beach nourishment in accordance with section 1(c) of this Act, and as may result from the normal procedure applying to projects authorized after submission of survey reports.

(b) All provisions of existing law relating to surveys of rivers and harbors shall apply to surveys relating to shore protection and section 2 of the River and Harbor Act approved July 3, 1930 as amended (33 U.S.C. 426), is modified to the extent inconsistent herewith.

(c) The cost-sharing provisions of this Act shall apply in determining the amounts of Federal participation in or payments toward the costs of authorized projects which have not been substantially completed prior to the date of approval of this Act, and the Chief of Engineers, through the Beach Erosion Board, is authorized and directed to recompute the amounts of Federal contribution toward the costs of such projects accordingly.

SEC. 4. As used in this Act, the word 'shores' includes all the shorelines of the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, and lakes, estuaries, and bays directly connected therewith.

PUBLIC LAW 71, 84TH CONGRESS
Approved June 15, 1955

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in view of the severe damage to the coastal and tidal areas of the eastern and southern United States from the occurrence of hurricanes, particularly the hurricanes of August 31, 1954, and September 11, 1954, in the New England, New York, and New Jersey coastal and tidal areas, and the hurricane of October 15, 1954, in the coastal and tidal areas extending south to South Carolina, and in view of the damages caused by other hurricanes in the past, the Secretary of the Army, in cooperation with the Secretary of Commerce and other Federal agencies concerned with hurricanes, is hereby authorized and directed to cause an examination and survey to be made of the eastern and southern seaboard of the United States with respect to hurricanes, with particular reference to areas where severe damages have occurred.

SEC. 2. Such survey, to be made under the direction of the Chief of Engineers, shall include the securing of data on the behavior and frequency of hurricanes, and the determination of methods of forecasting their paths and improving warning services, and of possible means of preventing loss of human lives and damages to property, with due consideration of the economics of proposed breakwaters, seawalls, dikes, dams, and other structures, warning services, or other measures which might be required.

SEC. 3. There are hereby authorized to be appropriated such sums as may be necessary to carry out the provisions of this Act.

PUBLIC LAW 874, 87TH CONGRESS, Approved October 23, 1962
as amended by
PUBLIC LAW 298, 89TH CONGRESS, Approved October 27, 1965

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled

SEC. 101. (Authorizes certain navigation and beach erosion projects).

SEC. 102. That the Secretary of the Army is hereby authorized to reimburse local interests for such work done by them on the beach erosion projects authorized in Section 101, and in other sections of this Act, subsequent to the initiation of the cooperative studies which form the basis for the projects: Provided, That the work which may have been done on these projects is approved by the Chief of Engineers as being in accordance with the projects herein adopted: Provided further, That such reimbursement shall be subject to appropriations applicable thereto or funds available therefor and shall not take precedence over other pending projects of higher priority for improvements.

SEC. 103. (Amends Public Law 727, 79th Congress as amended by Public Law 826, 84th Congress).

SEC. 110. The Secretary of the Army is hereby authorized and directed to cause Surveys of the coastal areas of the United States and its possessions, including the shores of the Great Lakes, in the interest of beach erosion control, hurricane protection and related purposes: Provided, That surveys of particular areas shall be authorized by appropriate resolutions of either the Committee on Public Works of the United States Senate or the Committee on Public Works of the House of Representatives.

PUBLIC LAW 172, 88TH CONGRESS
Approved November 7, 1963

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Board established by Section 2 of the River and Harbor Act approved July 3, 1930, as amended (33 U.S.C. 426), referred to as the Beach Erosion Board, is hereby abolished. There shall be established under the Chief of Engineers, United States Army, a Coastal Engineering Research Center which, except as hereinafter provided in Section 3 hereof, shall be vested with all the functions of the Beach Erosion Board, including the authority to make general investigations as provided in Section 1 of the Act approved July 31, 1945 (59 Stat. 508), and such additional functions as the Chief of Engineers may assign.

SEC. 2. The functions of the Coastal Engineering Research Center established by Section 1 of this Act, shall be conducted with the guidance and advice of a Board on Coastal Engineering Research, constituted by the Chief of Engineers in the same manner as the present Beach Erosion Board.

SEC. 3. All functions of the Beach Erosion Board pertaining to review of reports of investigations made concerning erosion of the shores of coastal and lake waters, and the protection of such shores, are hereby transferred to the Board established by Section 3 of the River and Harbor Act approved June 13, 1902, as amended (33 U.S.C. 541), referred to as the Board of Engineers for Rivers and Harbors.

PUBLIC LAW 483, 90TH CONGRESS
Approved August 13, 1968

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled

SEC. 106. (a) The Chief of Engineers, Department of the Army, under the direction of the Secretary of the Army, shall make an appraisal investigation and study, including a review of any previous relevant studies and reports, of the Atlantic, Gulf, and Pacific coasts of the United States, the coasts of Puerto Rico and the Virgin Islands, and the shorelines of the Great Lakes, including estuaries and bays thereof, for the purpose of (1) determining areas along such coasts and shorelines where significant erosion occurs; (2) identifying those areas where erosion presents a serious problem because the rate of erosion, considered in conjunction with economic, industrial, recreational, agricultural, navigational, demographic, ecological, and other relevant factors, indicates that action to halt such erosion may be justified; (3) describing generally the most suitable type of remedial action for those areas that have a serious erosion problem; (4) providing preliminary cost estimates for such remedial action; (5) recommending priorities among the serious problem areas for action to stop erosion; (6) providing State and local authorities with information and recommendations to assist the creation and implementation of State and local coast and shoreline erosion programs; (7) developing recommended guidelines for land use regulation in coastal areas taking into consideration all relevant factors; and (8) identifying coastal areas where title uncertainty exist. The Secretary of the Army shall submit to the Congress as soon as practicable, but not later than three years after the date of enactment of this Act, the results of such appraisal investigation and study, together with his recommendations. The views of concerned local, State, and Federal authorities and interests will be taken into account in making such appraisal investigation and study.

(b) There are authorized to be appropriated such amounts, not to exceed \$1,000,000, as may be necessary to carry out the provisions of this section...

SEC. 111. The Secretary of the Army, acting through the Chief of Engineers, is authorized to investigate, study, and construct projects for the prevention or mitigation of shore damages attributable to Federal navigation works. The cost of installing, operating, and maintaining such projects shall be borne entirely by the United States. No such project shall be constructed without specific authorization by Congress if the estimated first cost exceeds \$1,000,000...

SEC. 215. (a) The Secretary of the Army, acting through the Chief of Engineers, may, when he determines it to be in the public interest, enter into agreements providing for reimbursement to States or political subdivisions thereof for work to be performed by such non-Federal public bodies at water resources development projects authorized for construction under the Secretary of the Army and the supervision of the Chief of Engineers. Such agreements may provide for reimbursement of installation costs incurred by such entities or an equivalent reduction in the contributions they would

otherwise be required to make, or in appropriate cases, for a combination thereof. The amount of Federal reimbursement, including reductions in contributions, for a single project shall not exceed \$1,000,000.

(b) Agreements entered into pursuant to this section shall (1) fully describe the work to be accomplished by the non-Federal public body, and be accompanied by an engineering plan if necessary therefor; (2) specify the manner in which such work shall be carried out; (3) provide for necessary review of design and plans, and inspection of the work by the Chief of Engineers or his designee; (4) state the basis on which the amount of reimbursement shall be determined; (5) state that such reimbursement shall be dependent upon the appropriation of funds applicable thereto or available therefor, and shall not take precedence over other pending projects of higher priority for improvements; and (6) specify that reimbursement or credit for non-Federal installation expenditures shall apply only to work undertaken on Federal projects after project authorization and execution of the agreement, and does not apply retroactively to past non-Federal work. Each such agreement shall expire three years after the date on which it is executed if the work to be undertaken by the non-Federal public body has not commenced before the expiration of that period. The time allowed for completion of the work will be determined by the Secretary of the Army, acting through the Chief of Engineers, and stated in the agreement.

(c) No reimbursement shall be made, and no expenditure shall be credited, pursuant to this section, unless and until the Chief of Engineers or his designee, has certified that the work for which reimbursement or credit is requested has been performed in accordance with the agreement.

(d) Reimbursement for work commenced by non-Federal public bodies no later than one year after enactment of this section, to carry out or assist in carrying out projects for beach erosion control, may be made in accordance with the provisions of section 2 of the Act of August 13, 1946, as amended (33 U S C. 426f). Reimbursement for such work may, as an alternative, be made in accordance with the provisions of this section, provided that agreement required herein shall have been executed prior to commencement of the work. Expenditures for projects for beach erosion control commenced by non-Federal public bodies subsequent to one year after enactment of this section may be reimbursed by the Secretary of the Army, acting through the Chief of Engineers, only in accordance with the provisions of this section.

(e) This section shall not be construed (1) as authorizing the United States to assume any responsibilities placed upon a non-Federal body by the conditions of project authorization, or (2) as committing the United States to reimburse non-Federal interests if the Federal project is not undertaken or is modified so as to make the work performed by the non-Federal Public body no longer applicable.

(f) The Secretary of the Army is authorized to allot from any appropriations hereafter made for civil works, not to exceed \$10,000,000 for any one fiscal year to carry out the provisions of this section. This limitation does not include specific project authorizations providing for reimbursement.

APPENDIX 2

Addresses of Corps of Engineers Officers

<u>Officer and Location</u>	<u>Address</u>
Chief of Engineers	Department of the Army, Office of the Chief of Engineers, Washington, D.C. 20314
Division Engineer, Lower Mississippi Valley	U. S. Army Engineer Division, Lower Mississippi Valley Division, P. O. Box 80, Vicksburg, Mississippi 39180
District Engineer, New Orleans	U. S. Army Engineer District, New Orleans, P. O. Box 60267, New Orleans, Louisiana 70160
Division Engineer, New England	U. S. Army Engineer Division, New England 424 Trapelo Road, Waltham, Massachusetts 02154
Division Engineer, North Atlantic	U. S. Army Engineer Division, North Atlantic 90 Church Street, New York, New York 10007
District Engineer, Baltimore	U. S. Army Engineer District, Baltimore P. O. Box 1715, Baltimore, Maryland 21203
District Engineer, New York	U. S. Army Engineer District, New York, 26 Federal Plaza, New York, New York, 10007
District Engineer, Norfolk	U. S. Army Engineer District, Norfolk 803 Front Street, Norfolk, Virginia 23510
District Engineer, Philadelphia	U. S. Army Engineer District, Philadelphia U. S. Custom House, 2nd & Chestnut Street, Philadelphia, Pennsylvania 19106
Division Engineer, North Central	U. S. Army Engineer Division, North Central 536 South Clark Street, Chicago, Illinois 60605
District Engineer, Buffalo	U. S. Army Engineer District, Buffalo, 1776 Niagara Street, Buffalo, New York 14207
District Engineer, Chicago	U. S. Army Engineer District, Chicago 219 South Dearborn Street, Chicago, Illinois 60604
District Engineer, Detroit	U. S. Army Engineer District, Detroit, P. O. Box 1027, Detroit, Michigan 48231

District Engineer, St. Paul	U.S. Army Engineer District, St. Paul, 1210 USPO and Customhouse, St. Paul, Minn. 55101
Division Engineer, North Pacific	U.S. Army Engineer Division, North Pacific, 220 N.W., 8th Avenue, Portland, Oregon 97209
District Engineer, Alaska	U.S. Army Engineer District, Alaska, P.O. Box 7002, Anchorage, Alaska 99501
District Engineer, Portland	U.S. Army Engineer District, Portland, P.O. Box 2946, Portland, Oregon 97208
District Engineer, Seattle	U.S. Army Engineer District, Seattle, 1519 Alaskan Way, South Seattle, Washington 98134
Division Engineer, Pacific Ocean	U.S. Army Engineer Division, Pacific Ocean Bldg. 96, Fort Armstrong, Honolulu, Hawaii 96813
Division Engineer, South Atlantic	U.S. Army Engineer Division, South Atlantic, 510 Title Bldg., 30 Pryor Street, S.W. Atlanta, Georgia 30303
District Engineer, Charleston	U.S. Army Engineer District, Charleston P.O. Box 919, Charleston, South Carolina 29402
District Engineer, Jacksonville	U.S. Army Engineer District, Jacksonville P.O. Box 4970, Jacksonville, Florida 32201
District Engineer, Mobile	U.S. Army Engineer District, Mobile, P.O. Box 2288, Mobile, Alabama 36601
District Engineer, Savannah	U.S. Army Engineer District, Savannah P.O. Box 889, Savannah, Georgia 31402
District Engineer, Wilmington	U.S. Army Engineer District, Wilmington P.O. Box 1890, Wilmington, North Carolina 28401
Division Engineer, South Pacific	U.S. Army Engineer Division, South Pacific, 630 Sansome Street, San Francisco, California 94111

District Engineer, Los Angeles	U. S. Army Engineer District, Los Angeles, P. O. Box 2711, Los Angeles, California 90053
District Engineer, San Francisco	U. S. Army Engineer District, San Francisco 100 McAllister Street, San Francisco, California 94102
Division Engineer, Southwestern	U. S. Army Engineer Division, Southwestern, 1114 Commerce Street, Dallas, Texas 75202
District Engineer, Galveston	U. S. Army Engineer District, Galveston, P. O. Box 1229, Galveston, Texas 77550
Director, Coastal Engineering Research Center	U. S. Army Coastal Engineering Research Center, 5201 Little Falls Road, N.W. Washington, D.C. 20016

APPENDIX 3

Single copies of the following publications are available from Publications Branch, U.S. Army Coastal Engineering Research Center, 5201 Little Falls Road, N.W., Washington, D.C. 20016. Since CERC printings are limited in number, the shelf supply is small.

All BEB and CERC publications are available from the Clearinghouse for Federal Scientific and Technical Information, 5285 Port Royal Road, Springfield, Virginia 22151. The price is \$0.65 for microfiche or \$3.00 for a hard copy. Request the AD Acquisition Number shown in parenthesis.

TM 101 (AD 150 543)	Dune Formation and Stabilization by Vegetation and Plantings, John H. Davis, 1957
TM 20 (AD 655 260)	Behavior of Beach Fill and Borrow Area at Sherwood Island State Park, Westport, Connecticut, William H. Vesper, 1967
TM 22 (AD 659 341)	Dune Stabilization with Vegetation on the Outer Banks of North Carolina, W.W. Woodhouse, Jr., and R.E. Hanes, 1967
TM 25 (AD 683 491)	The Tsunami of the Alaskan Earthquake, 1964, Basil W. Wilson and Alf Torum, 1968
TM 26 (AD 684 894)	Hurricane Surge Frequency Estimated for the Gulf Coast of Texas, B.R. Bodine, 1969
TM 27 (AD 690 803)	Corrosion and Protection of Steel Piling in Seawater, Laverne L. Watkins, 1969
TM 29 (AD 699 339)	Geomorphology and Sediments of the Nearshore Continental Shelf, Miami to Palm Beach, Florida, D.B. Duane and E.P. Meisburger, 1969
MP 3-59 (AD 699 408)	Hurricane Surge Predictions for Chesapeake Bay, C.L. Bretschneider, 1959
MP 4-59 (AD 699 904)	Hurricane Surge Predictions for Delaware Bay and River, C.L. Bretschneider, 1959
MP 1-64 (AD 440 882)	Concrete Block Revetment Near Benedict, Maryland, J.V. Hall, Jr. and R.A. Jachowski, 1964
MP 4-64 (AD 453 227)	Land Against the Sea, A.C. Rayner, ed., 1964
MP 1-70 (AD 702 902)	Experimental Dunes of the Texas Coast, Bard O. Gage, 1970
R 2-66 (AD 631 519)	Breakwaters with Vertical and Sloping Faces, Thorndike Saville, Jr., William J. Garcia, Jr. and Charles E. Lee, 1966

- R 3-66 Factors Affecting Beach Nourishment Requirements, Presque
(AD 631 520) Isle Peninsula, Eire, Pennsylvania, Dennis W. Berg, 1966
- R 1-67 Coastal Processes and Beach Erosion, J. M. Caldwell, 1967
(AD 652 025)
- R 2-67 Wave Tests of Revetment Using Machine-Produced Interlocking
(AD 659 170) Blocks, Jay V. Hall, Jr., 1967
- R 4-67 Variations in Groin Design, Dennis W. Berg and George M. Watts,
(AD 659 172) 1967
- R 1-68 Surf Observations Along the United States Coasts, J. M.
(AD 672 613) Darling, 1968
- R 2-69 Prototype Investigation of Stability of Quadripod Cover
(AD 697 531) Layer, Santa Cruz Harbor, California, O. F. Weymouth and
 O. T. Magoon, 1968
- R 3-69 Creation and Stabilization of Coastal Barrier Dunes, R. P.
(AD 697 532) Savage and W. W. Woodhouse, Jr., 1968
- R 1-70 Shallow Structural Characteristics of Florida Atlantic Shelf
(AD 702 003) as Revealed by Seismic Reflection Profiles, E. P. Meisburger
 and D. B. Duane, 1969
- R 2-70 Sand Inventory Program, David B. Duane, 1969
(AD 703 583)

The following is available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for \$3.00 postpaid in the United States, Canada, Mexico, and some Latin American countries. The price postpaid to other foreign countries is \$3.75.

Technical Report 4 Shore Protection, Planning and Design, 3rd Edition.,
 Coastal Engineering Research Center, 1966., Catalog
 No. D103.42/5:4



Wrightsville Beach, N.C., after completion of beach restoration and hurricane protection project.